News from the
Savannnah River National Laboratory

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FOR IMMEDIATE RELEASE

PITTCON SYMPOSIUM EXPLORES ROLE OF ANALYTICAL CHEMISTRY IN ADVANCING HYDROGEN ENERGY

AIKEN, S.C. (March 3, 2009) – "Analytical Challenges and Opportunities in the Hydrogen and Fuel Cell Energy Frontier" will be the subject of an invited symposium at the 60th Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy (Pittcon, March 8-13 at McCormick Place South, Chicago, Ill.). The symposium, organized by Dr. Amy Ekechukwu of the U.S. Department of Energy's Savannah River National Laboratory, will focus on analytical tools of the present and future to support fuel cell and hydrogen process development.

Hydrogen and fuel cells represent the future of energy in the United States. Fuel Cells are a proven technology, but more work is needed to make them cost-effective for use in cars, trucks, homes and businesses. Additional research and development is needed so that these technologies can provide clean, sustainable, domestically produced energy for transportation and other uses. This symposium will shed light on the important analytical tools and methods needed for the development and implementation of reliable, low-cost, high-performance fuel cell systems.

The opening speaker, Dr. John Van Zee, director of the National Science Foundation Center for Fuel Cells at the University of South Carolina, will provide an overview of state-of-the-art fuel cell and hydrogen research, as well as present the analytical challenges facing this field of research. In particular, he will focus on opportunities for analytical chemistry and measurement techniques in the development of cost-competitive Proton Exchange Membrane Fuel Cells (PEMFCs) and Fuel Cell Systems. Cost competitive Fuel Cell Systems will require high-volume manufacturing, requiring adaptation of analytical and measurement techniques for this high speed production. In addition, even with high volume production, there is still a need for new materials that meet the efficiency, durability, and cost requirements for PEMFCs, presenting challenges for assessing their durability.

Other presentations include:

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Dr. Trung Van Nguyen, director of the National Science Foundation Energy for Sustainability Program, will discuss the research challenges and opportunities in the sustainability energy area with an emphasis on hydrogen generation and storage and fuel cells. He will also discuss the funding opportunities in this area from the Energy for Sustainability Program, including examples of the program's recent awards in this area.

Dr. David Hobbs, senior advisory scientist at SRNL, will discuss challenges and progress in the development of a unique new electrolyzer for efficient hydrogen production. SRNL has been exploring the Hybrid Sulfur Process, a thermochemical process to provide global-scale quantities of hydrogen, using a sulfur dioxide depolarized electrolyzer (SDE). SRNL has developed and tested a fuel-cell design concept for the SDE with high electrochemical efficiency and a small footprint.

Dr. Amy Ekechukwu, senior fellow scientist at SRNL, will discuss the potential use of proton exchange membrane (PEM) electrolysis for hydrogen isotope recovery. The Tritium Facility at the Savannah River Site, which processes tritium (the radioactive form of hydrogen gas used in national defense), is considering replacing the existing process, which involves cracking water over magnesium beds, with a PEM electrolysis technology. One design proposal is to feed the cathode of the electrolyzer with vapor phase tritiated water. This presentation focuses on the experimental comparison of a cathode water vapor feed electrolyzer with a traditional anode liquid feed system.

Dr. Cortney Mittelsteadt, director of Energy Conversion Technologies at Giner Electrochemical Systems, will discuss measurement of physical properties of polymer electrolyte membranes (PEM). The PEM is at the heart of fuel cells being considered for automotive and portable applications. A need exists to quickly screen PEMs for their most important physical properties – such as conductivity, permeability, water uptake, etc. – to both qualify new PEMs in the development pipeline and for quality control on commercial PEMs. This presentation will cover methods developed for screening PEMs for these critical properties.

The symposium will be held Monday, May 9, beginning at 8:30 a.m. in Room S404a of McCormick Place South, Chicago, Ill. Complete information on this symposium and the Pittcon 2009 Technical Program can be found at www.pittcon.org.

SRNL is DOE's applied research and development national laboratory at the Savannah River Site (SRS). SRNL puts science to work to support DOE and the nation in the areas of environmental management, national and homeland security, and energy security. The management and operating contractor for SRS and SRNL is Savannah River Nuclear Solutions, LLC.

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